

CHAPTER I

INTRODUCTION

1.1 Background

Indonesia has been known as a maritime country due to two third of the are compose of water. Marine resources is overwhelming in Indonesia. Although the resource is so abundant but the level of food consumption of fish is lower when compared to other country in Asia such as Japan, Malaysia, Singapore, and Thailand. In 2009 the consumption of fish in Indonesia is only 26 kg/capita/year which are below the standard of FAO which is 30 kg/capita/year. In Japan the consumption of fish is 110 kg/capita/year, South Korea 60 kg/capita/year, Singapore 70 kg/capita/year, Malaysia 30 kg/capita/year, and Hongkong 80 kg/capita/year (Departemen Kelautan dan Perikanan Republik Indonesia, 2010).

Fish can be found in ocean (marine), fresh water, and brackish water. The examples of marine fish are shark, snapper, stingray, barracuda, and little tuna. Little tuna or known as *Euthynnus affinis* is very well known in Indonesia, it has high nutritious content especially the poly unsaturated fatty acid (PUFA) and high nutritious protein. For the fresh water fish are carp, tilapia, cutthroat, tiger, golden, lake, catfish and rainbow. Catfish or known as *Pangasius micronemus* is really well known in Indonesia, it is easy to be cultivated.

In general the chemical composition of fish are water content 80%, protein content 15- 20%, and fat content around 1-3% (Khanna, 2004). Due to the high water content in fish the degradation quality of fish is faster so it is better to

process the fish before the deterioration go further. Food product made from fish can be varies such as meatballs, crackers, surimi, sausage, and fish floss.

Surimi is a concentrate of fish muscle proteins that its bone have already removed and skinned mechanically (Lanier *et al.*, 1992). Surimi is a fish meat that has been processed into a paste and it is an intermediate product of the process of making food products. Food product can be produced from surimi, among others, kamaboko, fish meatballs, and sausage.

Surimi paste can be used to make fish sausage. Sausage is a food that made from ground meat, and usually salt, herbs, and spices. It is usually inserted into a casing that can be made from the animal intestinal, collagen, and can be synthetic. Fish sausage in Indonesia is still uncommon. However, sausage is one of the favorite foods in today's society. Thus, the manufacture of fish sausage can be used as alternative food products to increase fish consumption in Indonesia.

1.2 Research Problem

Fish is a source of food that vulnerable to rapid deterioration or have shorter shelf life if not processed immediately. Sausage is a processed meat based product that will be put inside the casing. Fish product in Indonesia has higher price compare to beef product. This could be happened because Indonesia sold the raw fish to other country, the other country processed it into food product, and sold back to Indonesia, that will make the price become higher due to taxes. Sausage can be made from any meat such as veal, pork, and fish. Fish used for making sausage could be made from marine fish and sea water fish. The example of marine fish that will be observed is little tuna (*Euthynnus affinis*) and for sea

water fish is cat fish (*Pangasius micronemus*). The intermediate product before making the sausage is surimi. The production of sausage from fish meat is expected to increase fish consumption in Indonesia.

1.3 Objective

This research has several objective including general and specific objectives.

1.3.1 General Objective

The general objective of this research is to develop a fish sausage product from different types of fish which is marine fish (*Euthynnus affinis*) and fresh water fish (*Pangasius micronemus*) that can be accepted by the consumer.

1.3.2 Specific Objective

The specific objective of this research is to learn the effect of addition carboxyl methyl cellulose (CMC) in different concentration and the internal temperature of fish sausage during cooking toward the characteristic of fish sausage.

